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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Kazuyuki Yamane

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EXAMINER

PIERY, MICHAEL T

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/579,560	Applicant(s) YAMANE ET AL.	
	Examiner MICHAEL T. PIERY	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-3 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sirek et al. (US 6,649,792) in view of applicant's admitted prior art (Pages 1-3 of Specification) further in view of Shiiki et al. (US 6,673,403) and Bigg et al. (US 2002/0123546).

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Regarding claims 1 and 2, Sirek teaches recycling PET resin by breaking (grinding) a shaped structure (Column 2, lines 54-63), washing the pieces with alkaline water (Column 3, lines 15-29) and recovering the PET (Column 3, lines 30-38). Applicant discloses PET resin with gas barrier coating is a desirable composition for bottles, and further it is desirable to recycle these bottles (Page 2). Shiiki discloses polyglycolic acid is a gas barrier layer commonly used in conjunction with PET base resin for drink containers (i.e. bottles) (Column 1, lines 5-16; Column 2, lines 49-55; Column 4, lines 33-52). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of Sirek to include PET bottles containing a polyglycolic acid gas barrier layer because gas barrier layers improve the preservability of the contents therein (Applicant's Page 2) and polyglycolic acid is a suitable barrier layer while imposing little burden on the environment (Column 2, lines 5-11 of Shiiki). Sirek does not explicitly teach adjusting the moisture content of aliphatic polyester resin. However, Bigg teaches aliphatic polyesters begin degrading when the moisture content increases in the polymer (Paragraph 0020). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of Sirek to include a step of adjusting the moisture content of the aliphatic polyester resin because it is desirable to separate the aliphatic polyester from the PET resin in a composite bottle (Applicant's specification Page 2) and increasing the moisture content of the aliphatic polyester increases the degradation rate (Paragraph 0002 of Bigg) and therefore reduces the time required for the recycling process. The moisture content of the resin is a result effective variable because the yield of the hydrolysis reaction is dependent on the amount of water contained in the polymer. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the claimed moisture

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content since it has been held that optimization of a result effective variable involves only routine skill of one in the art.

Regarding claim 3, Bigg teaches moisture content is adjusted when water diffuses into a polymer via liquid (Paragraph 0020). Though not explicitly stating immersing the polymer in the liquid, it would have been obvious to one of ordinary skill in the art at the time of the invention to immerse the polymer in a water since immersion is a well-known method of contacting a polymer with a liquid.

Regarding claims 8 and 9, Shiiki teaches using a bottle with a glycolic acid polymer (Column 2, lines 50-55) and a PET base resin (Column 4, lines 40-45).

Regarding claim 10, Shiiki teaches the bottle has a PGA/PET/PGA configuration (Column 4, lines 15-21).

Regarding claim 11, applicant discloses it is known to use colored PET bottles (Page 2). It would have been obvious to one of ordinary skill in the art at the time of the invention to use colored aliphatic polyester resin since colored bottles prevent photodegradation of contents (Page 2).

3. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sirek et al. (US 6,649,792) in view of applicant's admitted prior art (Pages 1-3 of Specification) further in view of Shiiki et al. (US 6,673,403) and Bigg et al. (US 2002/0123546), as applied above to claim 1, further in view of Roh et al. (US 6,031,128).

The modified Sirek reference teaches the method of claim 1, as applied above.

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Regarding claims 4-7, Sirek teaches an exemplary alkaline water solution for washing PET to facilitate terephthalic acid recovery but does not explicitly teach incorporating aqueous caustic soda in 1-3% and a surfactant at 70-98 degrees C. However, Roh teaches it is known to wash PET with an alkaline water solution comprising aqueous caustic soda in 1-3% (Column 5, lines 15-17) and a surfactant (Column 5, lines 32-35) at 70-98 degrees C (Column 5, lines 55-60) containing at least 1 equivalent with respect to the aliphatic polyester (Column 5, lines 59-61). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the process of Sirek to include the solution of Roh since both alkaline solutions are useful for precipitating PET and substitution of known equivalent alkaline solutions is within routine skill of one in the art.

Response to Arguments

Applicant's arguments filed February 12, 2009 have been fully considered but they are not persuasive.

Applicant argues the claimed method recovers the principal resin intact while the Sirek reference recovers the components separately. The examiner disagrees. The claims do not limit the recovery process to recovering the principal resin intact, rather the claims only require recovering the resin.

Applicant argues that AAPA and Shiiki do not remedy the deficiencies of Sirek. The examiner notes that AAPA and Shiiki have been relied upon to demonstrate the obviousness of substituting a PET bottle containing a polyglycolic acid barrier layer for a PET bottle. As

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discussed in the action, this would have been obvious because of the advantageous characteristics the barrier provides to PET bottles.

Applicant argues that acceleration of aliphatic polyester degradation is performed by addition of an activator compound, as taught by Bigg rather than by adjusting the moisture content and therefore Bigg does not suggest a moistening step. The examiner disagrees. Bigg teaches hydrolytic degradation is the preferred method (paragraph 0018) for degrading the materials of disclosed materials including glycolic acid (paragraph 0031). Bigg further teaches that this degradation begins when water is obtained from the atmosphere and diffuses into the film (paragraph 0020). This degradation is triggered in an environment where the film is exposed to steam (paragraph 0018). In summation, it is known to form PET bottles containing PGA, it is known that separation of PGA from PET is desirable, and Bigg teaches it is known that PGA degrades upon exposure to steam treatment (which inherently adjusts the moisture content). It would have been an obvious modification to add a step of exposing the PGA/PET bottle to steam in order to degrade the PGA prior to the step applying an alkali cleaning liquid (which removes the impurities (PGA) from PET) because the PGA would not be successfully removed by alkaline treatment if not degraded.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL T. PIERY whose telephone number is (571)270-5047. The examiner can normally be reached on M-Th 8:30-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael T Piery/
Examiner, Art Unit 1791

/Monica A Huson/
Primary Examiner, Art Unit 1791